

**PUBP 804 MULTIVARIATE STATISTICAL ANALYSIS IN PUBLIC POLICY  
Spring 2003**

**INSTRUCTOR:**

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**TIME & PLACE:**                      Wed 4:30 – 7:10 pm                      Krug 209

**PREREQUISITE:**                      PUBP 704 or equivalent

**COURSE DESCRIPTION:** The course examines the major techniques of multivariate statistical analysis in the social sciences, with emphasis on the applications in policy studies. The course begins with a brief review of research design and the fundamentals of statistical analysis, and then moves on to the major multivariate techniques commonly used in policy research. The course covers the logic of causal analysis using multivariate cross-tabulations, reliability theory and validity assessment, factor analysis and construction of factor scales, bivariate and multivariate regression, path analysis and structural equations, and the analysis of variance and covariance. The course stresses applications and interpretations over mathematical foundations, and in particular it will emphasize the application of multivariate statistics to a real, complex database using an advanced statistical package.

**EVALUATION:** The grade will be based on homework assignments (1/3), a midterm (1/3), and a final examination (1/3). The midterm will cover the first half of the course (roughly) and the final exam will cover the last half of the course.

**REQUIRED TEXTS:**

1. Hutcheson and Sofroniou, *The Multivariate Social Scientist*, SAGE Publications
2. Maruyama, *Basics of Structural Equation Modeling*, SAGE Publications
3. Hamilton, *Statistics with Stata 7*, Duxbury Press
4. Reynolds, *Analysis of Nominal Data*, SAGE Publications
5. Carmines and Zeller, *Reliability and Validity*, SAGE Publications

Selected readings from Stata manuals and data codebooks

Handouts from various sources and readings on reserve in the library

**TOPICS AND READINGS:**

January 22      Introduction to multivariate analysis; definitions of data and quantitative techniques; discussion of computer-based data analysis

- January 29 Brief review of research designs, descriptive statistics, and the introduction to data analysis with Stata  
Hamilton, Ch. 1; Ch. 2 p. 12-28; Ch. 3 p. 58-72
- February 5 Analysis of nominal data and contingency tables (cross-tabs); more on Stata  
Reynolds, *Analysis of Nominal Data*  
Hamilton, Ch. 4  
Selected chapters from Stata manuals
- February 12 Statistical tests and measures of association for contingency tables; computer lab
- February 19 Reliability and validity of social measurement  
Carmines & Zeller, *Reliability and Validity Assessment*  
Hutcheson, Ch. 2.1 to 2.5
- February 26 Principle components, factor analysis, and rotations  
Hutcheson, Ch. 6  
Hamilton, Ch. 12
- March 5 Factor analysis application and factor scaling; computer lab  
Armor, "Factor Scaling and Theta Reliability" (handout & reserve)  
Maruyama, Ch. 7
- March 12 [RECESS]
- March 19 Review, midterm
- March 26 Multiple regression analysis  
Hutcheson, Ch. 3  
Hamilton, Ch. 6, 7
- April 2 Path analysis and structural equations  
Maruyama, Ch. 3, 4, & 6

- April 9            Logistic regression and other nonlinear regression  
  
                      Hutcheson, Ch. 4  
                      Hamilton, Ch. 10 then Ch. 9
- April 16            Analysis of variance and covariance  
  
                      Handout (basis equations and steps in ANOVA)  
                      Hamilton, Ch. 5
- April 23            Selected advanced multivariate techniques  
  
                      Hutcheson, Ch. 7  
                      Maruyama, Ch. 8,9
- April 29            Review; final